Remarks:

Applicants (hereinafter, Applicant) hereby request reconsideration of the application.

Claims 1-28 remain in the application. Claim 1 has been amended. No new matter is added. Claim 24 is withdrawn from consideration. Claims 25-26 have been canceled.

In the second paragraph on page 2 of the Office action, claims 1-9, 17-23, 25-26 and 28 have been rejected as being obvious over Cheek et al. (U.S. Pat. No. 5,935,766) (hereinafter, "Cheek") in view of Chiang et al. (U.S. Pat. No. 5,739,579) (hereinafter, "Chiang") under 35 U.S.C. § 103.

In the third paragraph on page 6 of the Office action, claims 1-7 and 27 have been rejected as being obvious over Cheek in view of Bothra et al. (U.S. Pat. No. 5,798,559) (hereinafter, "Bothra") under 35 U.S.C. § 103.

The rejections have been noted and claim 1 has been amended in an effort to even more clearly define the invention of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia, an integrated electrical circuit, comprising:

said first insulation layer having first contact holes disposed therein, and said first contact holes being filled with a metal;

a second insulation layer disposed above said first insulation layer;

said second insulation layer having second contact holes disposed therein and filled with electrical connecting leads, and said second contact holes being further filled with copper in a whole-area manner;

said connection pieces being made of aluminum and covering said first contact holes and contacting said connection leads, and said connection pieces being covered by said second isolation layer. (Emphasis added.)

The *Cheek* reference is directed to a method of forming a conductive plug in an interlevel dielectric, including forming a lower dielectric layer over a semiconductor substrate. A first etch mask is formed over the lower dielectric layer and is patterned using a reticle. A first etch is applied through an opening in the first etch mask to form an opening in the

lower dielectric layer. A lower conductor is formed in the opening in the lower dielectric layer. A conducting layer is formed over the lower dielectric layer and the lower conductor.

A second etch mask is formed over the conducting layer and is patterned using the reticle. A second etch is applied through an opening in the second etch mask to form a contact pad from an unetched portion of the conducting layer. An upper dielectric layer is formed over the lower dielectric layer and the contact pad.

A third etch mask is formed over the upper dielectric layer and is patterned using the reticle. A third etch is applied through an opening in the third etch mask to form an opening in the upper dielectric layer. An upper conductor is formed in the opening in the upper dielectric layer. Consequently, the conductive plug includes the upper and lower conductors and the contact pad, and the interlevel dielectric includes the upper and lower dielectric layers.

The *Bothra* reference discloses a method of making an integrated circuit interconnect structure having air as the effective dielectric between metallization layers including the steps of: a) providing an air dielectric formation layer of a sacrificial material over a substrate; b) forming pillar

holes in the air dielectric formation layer; c) filling the pillar holes with a non-sacrificial material; d) constructing a metallization layer over the sacrificial air dielectric formation layer and nonsacrificial material pillars; and e) applying an isotropic etchant to the interconnect structure to remove the sacrificial material, leaving the non-sacrificial material pillars for mechanical support of the metallization layer. An interconnect structure having an air dielectric includes a bottom metallization layer, a top metallization layer, and a plurality of pillars separating the bottom and top metallization layers and mechanically supporting the top metallization layer.

In other words, in the Bothra reference, there is no connection piece, which is made of aluminum, in contrast to the *present invention*. For example, the metallization layer 118 is formed in a three-step process in order to form a TiN-Al/Cu-TiN structure. See col. 5, lines 60++.

Moreover, in the *present invention*, a first insulating layer (115) and a second insulating layer (320) are disclosed. Respective first (170) and second (330) contact holes are disposed in the first and second insulating layers. The second contact holes (330) are filled with copper in a whole-area manner. See page 18, lines 5++ of the specification of the instant application. The copper plug contacts the

connection piece (250) practically. Accordingly, the present invention solves the problem of copper diffusion by using the blocker layer and the connection piece.

In Cheek, only the metal-1-layer or the metal-2-layer can include copper. See column 10, lines 8++, Cheek. The contact holes do not contain copper. In Chiang, the contact holes (361) contain copper. However, in order to prevent diffusion of copper, *a nitride liner* 360 is arranged within the contact holes. In contrast, in the *present invention*, the contact hole does not contain a nitride liner. The contact hole is whole-area-filled with copper. Instead of using a nitride liner, the *present invention* employs an aluminium contact piece and the blocker layer.

Clearly, the references do not show "*said first insulation layer having first contact holes disposed therein, and said first contact holes being filled with a metal; a second insulation layer disposed above said first insulation layer; said second insulation layer having second contact holes disposed therein and filled with electrical connecting leads, and said second contact holes being further filled with copper in a whole-area manner; said connection pieces being made of aluminum and covering said first contact holes and contacting said connection leads, and said connection pieces being covered by said second isolation layer*", as recited in claim 1

of the instant application (emphasis added). Thus, neither can the specific combination of the aforementioned limitations be shown.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on claim 1, they are believed to be patentable as well.

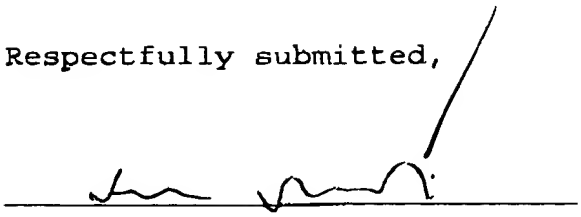
In view of the foregoing, reconsideration and allowance of claims 1-24 and 27-28 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, the Examiner is respectfully requested to telephone counsel so that, if possible, patentable language can be worked out.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and

Greenberg, P.A., No. 12-1099.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claim 1 (twice amended). An integrated electrical circuit, comprising:

a plurality of structure planes including at least one element structure plane;

electrically active elements disposed on said at least one element structure plane;

[at least one] a first insulation layer disposed above said at least one element structure plane;

[electrical connecting leads disposed at least one of within and above said insulation layer, at least a portion of said electrical connecting leads contain copper];

said first insulation layer having first contact holes disposed therein, and said first contact holes being filled with a metal;

a second insulation layer disposed above said first insulation layer;

said second insulation layer having second contact holes disposed therein and filled with electrical connecting leads, and said second contact holes being further filled with copper in a whole-area manner;

connection pieces disposed underneath said electrical connecting leads and above said first contact holes;

at least one diffusion blocker disposed underneath said electrical connecting leads, said diffusion blocker at least one of [impedes and prevents] impeding and preventing a diffusion of copper, said diffusion blocker configured as a blocker layer interrupted only in at least one of a region having said second contact holes formed therein and a region of said connection pieces, said blocker layer disposed between said [at least one element structure plane] first insulation layer and said second insulation layer; and

said connection pieces being made of aluminum and covering said first contact holes and contacting said connection leads[;], and said connection pieces being covered by said second isolation layer[; and

a plurality of further contact holes being formed in said isolation layer and being filled with a metal, said metal being connected to at least one of said connecting leads].